US Army Medical Research and Materiel

Technology Available for Licensing

Nasopharyngeal Airway with Reflectance Pulse Oximeter Sensor

Features and advantages:

- **Could use to monitor arterial oxygen saturation levels in severely burned patients**
- **Insignificant mean differences seen in reflectance and trans- illumination pulse oximeter SpO_2 readings**
- **Useful in field and emergency areas as it combines two devices into one**

Patent Status

used for sensor

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Point of Contact

Dr. Paul C. Merle
Director, Office of Research and Technology Applications
USAMRMC, MCMR-ZA-J
504 Scott St., Ft. Detrick, MD 21702-5012
E-mail: usamrmcorta@amedd.army.mil
Voice: 301-619-6664/2032/7219 Fax: 301-619-5034

KEYWORDS: Alternative oximetry; nasal; reflectance oximetry; difficult to monitor; central oximetry

This invention combines a nasopharyngeal airway with a reflectance pulse oximeter sensor. Nasopharyngeal airways are used in the operating room to establish communication between the nares and the posterior pharynx. They may also be used to perform nasal suctioning. The combined airway and sensor is capable of monitoring the posterior pharynx, posterior soft palate, or nasal mucosa, which contain rich capillary beds. Sensor elements may be embedded in the thickened wall section of the airway. The elements may include a light source which preferably emits light at wavelengths around 660 nm (red) and around 940 nm (near infrared), and a light detector. The elements may be connected to a pulse oximeter monitor (spectrophotometer) or other external device for analysis.

Conventional transillumination pulse oximetry relies on the capillary bed of a peripheral digit. However, it is not unusual for multi-trauma and thermally injured patients to have either severe peripheral vasoconstriction or damaged or missing peripheral vascular beds. Reflectance pulse oximetry provides an alternative approach to transillumination. It is achieved with very accurate results by the backscattering of incident bispectral light that traverses and, on reflection from nonabsorptive collagenous tissues, retraverses formed elements in the ck to the oximetric detector. The nasal mucosa and posterior pharynx contain rich capillary beds that are ideal for reflectance pulse oximetry.

Posterior pharyngeal reflectance pulse oximetry was d to conventional peripheral transillumination pulse oximetry in 8 burn patients during surgery. The mean differences between the two sets of values were insignificant in all cases.

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